accordance with design considerations for any particular application without deviating from the scope of this invention. For example, a pendulum means or a metronome means may be substituted for rotating magnet 35 or mild steel armature 54, while still accomplishing the same result. It should further be pointed out that although the magnet 35, as illustrated in FIG. 2, will generate substantially sinusoidal voltage waveform in winding 37, and armature 54 a half-wave sinusoidal form, that such is not necessary to obtain the results desired in accordance with the present invention. Any source of a magnetic field which will generate a recurring waveform of voltage in winding 37 will operate satisfactorily.

There has thus been disclosed an apparatus for effecting proportional temperature control of a given unit which is simple but at the same time maintains very accurate control and requires little or no maintenance and is therefore more economical than apparatus heretofore known in the art.

What is claimed is:

1. In a thermocouple temperature control system having a thermocouple and circuit therefor for controlling the temperature of a given unit, the improvement for overcoming thermal and mechanical lag which may be present in the system comprising: a pair of pole pieces, a flux path interconnecting said pole pieces, a disc-shaped magnet rotatably supported between said pole pieces, means for rotating said magnet at a substantially constant speed, windings wound upon said flux path, said windings being a part of said thermocouple circuit whereby a low amplitude, low frequency periodically recurring magnetic field is generated by the rotation of said magnet and a low amplitude, low frequency periodically recurring voltage is superimposed upon a voltage generated by said thermocouple.

2. In a thermocouple temperature control system for controlling the temperature of a given unit, the improvement for overcoming thermal and mechanical lag which may be present in the system comprising: first and second pole pieces, a low reluctance flux path interconnecting said pole pieces, a permanent magnet supported to move between said pole pieces, means for rotating said magnet at a substantially constant speed at least one thermocouple lead wound upon said flux path, whereby a substantially constant frequency and amplitude waveform voltage is induced in said winding when said magnet moves between said pole pieces and is superimposed upon a voltage generated by said thermocouple.

3. In a thermocouple temperature control system having a thermocouple and circuit therefor for controlling the temperature of a given unit, the improvement for overcoming thermal and mechanical lag which may be present in the system comprising: a magnet having North and South poles, means having first and second pole pieces and providing an interrupted flux path between said poles, means movably supported to periodically substantially close said flux path, a winding upon said flux path means, said winding including at least a portion of said thermocouple circuit, whereby a substantially constant amplitude and frequency waveform voltage is induced in said winding when said magnet moves between said pole pieces and is superimposed upon a voltage generated by said thermocouple.

4. In a thermocouple temperature control system having a thermocouple and circuit therefor for controlling the temeprature of a given unit, the improvement for overcoming thermal and mechanical lag which may be present in the system comprising: a magnet, means comprising first and second pole pieces forming a flux path cooperating with said magnet, a winding including at least a portion of said thermocouple circuit upon said flux path, means for periodically varying the reluctance of said flux path, whereby a substantially constant amplitude and frequency waveform voltage is induced in said winding when said magnet moves between said pole pieces and is superimposed upon a voltage generated by said thermocouple.

5. A system for controlling the temperature of a given unit comprising: a thermocouple circuit comprising a thermocouple for sampling the temperature of said unit and generating a voltage in response thereto, a heating element, a control unit connected between the thermocouple and the heating element for causing said heating element to apply heat to the unit when the voltage in said thermocouple falls below a predetermined point, magnetic field generator means for generating a magnetic field about a portion of said thermocouple circuit and mechanical means coupled to said generator means, for periodically varying said magnetic field, thus superimposing a constant low frequency, constant low amplitude voltage upon the voltage generated by said thermocouple.

6. In a thermocouple temperature control system having a thermocouple and circuit therefor for controlling the temperature of a given unit, the improvement for overcoming thermal and mechanical lag which may be present in the system comprising: a magnet having North and South poles, means providing an interrupted flux path between said poles, means movably supported to periodically substantially close said flux path, a winding upon said flux path means, said winding including at least a portion of said thermocouple circuit, a magnetic field generator, a magnetic flux path cooperating with said generator, and a winding upon said flux path including one portion of a circuit connected to said thermocouple for superimposing a constant low frequency, constant low amplitude voltage upon the voltage generated by said thermocouple.

7. In a thermocouple temperature control system having a thermocouple circuit comprising a thermocouple, and a temperature controller responsive to the temperature induced voltage of said thermocouple, the improvement for overcoming thermal and mechanical lag which may be present in the system, which improvement comprises: means for generating in said thermocouple circuit an independent recurring waveform voltage, said means consisting essentially of magnetic field generating means inductively coupled to said thermocouple circuit, and mechanical means coupled to said generating means for periodically varying the magnetic field generated thereby, whereby to induce voltage changes in said circuit.

8. A system according to claim 7 wherein said voltage waveform is of a substantially constant frequency.

9. A system accordng to claim 7 wherein said waveform is of a frequency from $\frac{1}{10}$ to 10 cycles per second.

10. A system according to claim 7 wherein said waveform voltage has a substantially constant amplitude.

11. A system according to claim 7 wherein said waveform voltage has an amplitude of from 0 to 5 millivolts.

References Cited in the file of this patent

UNITED STATES PATENTS

1,987,539	Razek	Jan. 8, 1935
2,113,436	Williams	Apr. 15, 1938
2,218,859	Schweitzer	Oct, 22, 1940
2,220,028	Smith	Oct. 29, 1940
2,233,924	McKibben	Mar. 4, 1941
2,376,488	Jones	May 22, 1945
2,696,739	Endres	Dec. 14, 1954